FEATURE / MANCHETTE

Determining the information literacy needs of a medical and dental faculty[1]

Dale Storie and Sandy Campbell

Abstract: Introduction: The Faculty of Medicine and Dentistry at the University of Alberta is large and diverse. Liaison librarians at the Health Sciences Library decided in late 2009 to undertake a system-wide evaluation of the information literacy (IL) instruction being delivered to the Faculty. The goals of the evaluation were to identify current strengths and gaps in instruction, to realign teaching priorities, and to inform the development of effective asynchronous Web-based delivery mechanisms, such as interactive tutorials, to support the Faculty's move to electronic course delivery. **Methods:** The main data collection method was a survey of different user groups in the Faculty, including undergraduate and graduate students, residents, and faculty. Secondary data included a literature review, consultation with key collaborators and analyzing program documents. **Results:** All undergraduate medical students receive IL instruction. Fewer than a third of graduate students, only half of residents, and a small fraction of faculty, receive instruction. The current curriculum needs to be revised to be less repetitive. Most respondents wanted to receive training on advanced database searching, and preferred in-person instruction sessions. Web-based tutorials were the next most popular mode of delivery. **Discussion:** This study is one of the few medical information literacy surveys that used a broad, strategic approach to surveying all user groups at a medical school. These data provide a baseline overview of existing instruction across user groups, determine potential need for IL instruction, provide direction for what should be taught, and identify preferred methods for delivery of a comprehensive training program centered on Faculty needs.

Introduction

Development of information literacy skills is recognized as an important aspect of medical education and the practice of evidence-based medicine. In particular, information retrieval and critical appraisal of information have become important because medical education standards require medical students and residents to possess competency in those skills [1, 2].

At the University of Alberta, the John W. Scott Health Sciences Library has historically been heavily involved with reference and instruction for the Faculty of Medicine and Dentistry, providing training sessions for students, residents, clinicians, and faculty. Information literacy instruction is embedded in the undergraduate medicine curriculum, with lectures and assignments integrated into four course blocks during the four-year degree program. Librarians are also involved as facilitators in discovery learning small group sessions (similar to problem-based learning), in which students search for evidence on a weekly basis to support their discussions of practice cases.

Over the last several years, the Faculty of Medicine and Dentistry has grown in size, increased its use of electronic resources, and adopted new e-learning initiatives. In the period from 2005–2009, the Faculty increased its total number of students (including undergraduate, graduate, and medical residents) from 1984 to 2355. In 2008, it adopted a new virtual learning environment, which has been leveraged to increase electronic delivery of curriculum content through interactive tutorials and podcasted lectures. In addition to the undergraduate medical and dental programs, the Faculty offers approximately 20 graduate programs, and over 50 residency programs. It is both teaching and research-intensive, with many clinical and basic sciences research programs and a large number of grant-funded staff and clinical faculty.

Liaison librarians at the Health Sciences Library decided in late 2009 to undertake a system-wide evaluation

D. Storie[2] MLIS, MA. Public Services Librarian, John W. Scott Health Sciences Library 2K3.28 Walter Mackenzie Centre, University of Alberta, Edmonton, AB T6G 2R7, Canada.
S. Campbell MLS, AFLIA (CP). Public Services Librarian, John W. Scott Health Sciences Library, 2K3.28 Walter Mackenzie Centre, University of Alberta, Edmonton, AB T6G 2R7, Canada.

[1]This article has been peer reviewed.
[2]Corresponding author (e-mail: dale.storie@ualberta.ca).

of the information literacy (IL) instruction being delivered to the Faculty. The goals of the evaluation were to identify current strengths and gaps in instruction, to realign teaching priorities, and to inform the development of effective asynchronous Web-based delivery mechanisms, such as interactive tutorials, to support the Faculty's move to electronic course delivery and ensure point-of-need assistance for distance users. The end-goal of this evaluation is the development of a comprehensive IL program that meets the needs of all constituents within the Faculty, to be implemented and formally assessed in stages over a three year period.

This paper presents the results of an initial evaluation of IL instruction to undergraduate students, graduate students, residents, and faculty members. This evaluation addresses the following questions:

1) Who are librarians currently reaching with instruction?
2) Are librarians reaching everyone who could benefit from instruction?
3) Are current programs meeting user needs effectively?
4) How can librarians make sure that everyone who needs instruction receives it in a timely and appropriate way?

Literature review

Information literacy is recognized as an important competency in medical education. The Association of American Medical Colleges' *Report on Learning Objectives for Medical Education* states that physicians must possess the "ability to retrieve (from electronic databases and other resources), manage, and utilize biomedical information for solving problems and making decisions that are relevant to the care of individuals and populations" [1]. Similarly, the Royal College of College of Physicians and Surgeons of Canada's CanMEDS competencies framework states that physicians must be able to "critically evaluate information and its sources, and apply this appropriately to practice decisions" [2]. Both of these competency statements resemble the ACRL information literacy standards familiar to many librarians [3].

This literature review focuses mainly on information literacy in an academic medical setting. However, it is worth mentioning that two previous systematic reviews on information literacy for health care professionals have found that information skills training is valued by users, who perceive that their skills have improved [4, 5]. Overall, subjective measures (such as self-reporting outcomes, learning satisfaction and perceived self-efficacy) suggest that IL training leads to skill improvement, even though objective measures indicate limited evidence of effectiveness [4]. Brettle, in a later systematic review focusing on evaluation methods, noted that training methods and evaluation tools used in the published research were very heterogeneous, which impacts the strength of the evidence [6]. More recent case studies on health sciences students and professionals have found that database searching training leads to greater awareness of resources and increase in database use [7–9] and increased requests for mediated searching [10].

Much of the literature explores integration of IL and related competencies into undergraduate and postgraduate medical education curricula. Kloda provides a basic overview of information literacy integration at Canadian medical schools [11], while other authors present year-by-year outlines of laddered instruction that offer close integration with undergraduate medical curricula [12–14]. Research also suggests that training should move from assignment-based searching to patient-based searching [15]; that problem-based learning (PBL) may help increase information literacy skills [16], but improvement is likely independent of librarian involvement [17], even though librarians are sometimes involved as PBL tutors [18]; and that online delivery of instruction can be as effective as classroom instruction [19–21].

One of the largest challenges in undergraduate and resident training is encouraging students who are very comfortable searching the Web (i.e. the Google Generation [22]) to use reputable, evidence-based resources and bibliographic databases rather than basic web search engines and Wikipedia [7, 23]. Hughes et al. indicates that junior physicians use Web 2.0 tools very frequently, and suggests there is benefit in allowing trainees to use these non-medical resources, provided they receive additional training on appropriate use [24]. Qualitative research has explored how medical students and residents integrate their new knowledge about learning resources throughout their training [25], indicating that students gain a better appreciation of certain resources when these resources are discovered or introduced at a contextually appropriate point in their learning. Overall, this literature suggests that information literacy instructors should focus on teaching appropriate use of non-medical and medical resources and should identify relevant points in curricula to introduce resources.

Several articles also describe the design or revision of resident education programs teaching evidence-based medicine concepts such as formulating a clinical question and effective PubMed searching. The programs are presented in a variety of formats, including in-depth workshops [26], multi-part programs delivered over several weeks [27, 28], or embedded training at point-of-need [29, 30].

Fewer studies have examined instruction for graduate students and faculty members in various fields, but the literature indicates that these populations are more challenging to reach effectively with instruction because they possess varying skill and comfort levels with information resources. Time constraints are also a factor [31, 33]. One study on graduate students suggests that while the students are unaware of many of the available resources, they are receptive to receiving training on a variety of topics in non-mandatory workshops [31]. Another study found that offering classes on literature searching and citation software was a good strategy for attracting students [32]. Research on IL instruction with medical or dental faculty is limited, but one study on public health faculty suggested a preference for on-demand assistance rather than workshop sessions [33]. Less literature exists on online delivery of instruction to non-undergraduate populations, but what

has been published suggests that it is effective at improving information literacy skills [34, 35].

There have been very few studies which attempt to describe or evaluate the current IL program of an entire medical/dental faculty. Two articles present models for delivering broad programs based on anecdotally observed best practices. The first, from Imperial College London, describes the implementation of a committee that handles instruction for the medical school's distributed program [36]. Librarians are spread across six campuses, so a new committee was formed which collectively produces teaching materials such as slides and workbooks, explores new educational technologies and provides train-the-trainer sessions. While the undergraduate curriculum content is described in some depth, little specific detail on postgraduate and staff training is given. The second article, from King's College London, provides an outline of IL topics delivered to users at all levels, and discusses challenges with delivering high quality IL training to a growing and diverse population [37]. The undergraduate medical training at King's College resembles year-by-year curricula described by other articles [12–14], while the graduate and staff training programs were integrated with information technology and research management topics, so that topics such as database searching were taught alongside Microsoft Office and statistics software training.

Much of the literature is comprised of case studies, especially when looking broadly at faculty-wide delivery. While all of these studies informed the development of the current survey and will inform further IL programs, none paralleled the particular mix of user constituencies or the specific educational programs found within the University of Alberta's Faculty of Medicine and Dentistry.

Methods

The proposed research project was submitted to the University's ethics review board and received approval in November 2009.

The primary data collection method was a survey delivered to constituents in the Faculty. Secondary methods of evaluation included consulting with key collaborators involved in medical education programs, collecting anecdotal feedback from users, and analyzing existing program documents for undergraduate medicine (e.g. syllabi, program objectives, assignments). Data from secondary methods are not explicitly discussed in this paper, but are used to inform survey results.

Surveys were distributed to undergraduates, graduate students (both clinical and research-based), residents, and full-time faculty members. Recognizing that some questions would be relevant only to specific groups, surveys were tailored for each group, meaning that four different surveys were distributed in total. Survey questions about preferred mode of delivery were not included on the undergraduate survey, since undergraduates were already required to attend information literacy sessions, and the Faculty's movement towards paperless delivery meant that certain instructional materials were already predetermined. Similarly, faculty members received additional questions about IL instruction for students, which would not be relevant to the other groups.

Undergraduates received an earlier iteration of the survey (Appendix 1) in paper format. This survey was released about a month in advance of the other surveys, so that the authors could distribute it during in a mandatory instruction session in students' clinical clerkship (Year 3). Due to the staggered timing of these mandatory sessions throughout the academic year, only a convenience sample of undergraduate students was surveyed. Instead of surveying pre-clinical students, the authors analyzed course evaluations, reviewed student assessments, and consulted medical education faculty.

Online surveys through Survey Monkey (Appendix 2) were distributed to all residents, graduate students and faculty via listserv (sent approximately a month after the undergraduate survey). These surveys differed significantly from the undergraduate survey, since many questions were revised based on feedback the authors received on the undergraduate survey. Otherwise, the three online surveys distributed to these groups were consistent except for minor adaptations to reflect the group being surveyed (as mentioned above).

Completion of the surveys was voluntary for all groups. For each group, current IL instruction and services provided by librarians are described. For multiple response questions (e.g. preferred resources, instruction topics), only the top answers out of all responses are reported.

Results

Undergraduate students

The undergraduate survey in print form was delivered to two classes of students doing their mandatory third year pediatrics rotation (34 students).

Information literacy is already highly integrated into the undergraduate curriculum through discovery learning and an evidence-based medicine course. In addition to these courses, librarians provide several instruction sessions on finding information. In past years, four sessions have typically been scheduled as follows: one at the start of Year 1, one halfway through Year 1, a review session at the end of Year 2, before students begin the clinical clerkship, and then a final session during the Year 3 pediatrics rotation. Each session corresponds with an assignment in which the students find and appraise evidence to answer a clinical question (two of these assignments form part of the final grade for their respective blocks).

Student evaluations indicate that the library instruction embedded in the courses is perceived to be useful but slightly repetitive. By the end of Year 2, pre-clinical students have completed variations of the same assignment several times, in addition to routinely finding information to support their discovery learning activities. Commentary from instructors reveals that students have little problem finding background information from summarized and synthesized sources, such as medical textbooks, but they still struggle with locating foreground information (information related to the specific question) and primary literature through database searching.

Fig. 1. Undergraduates' most commonly used resources (by number of times cited).

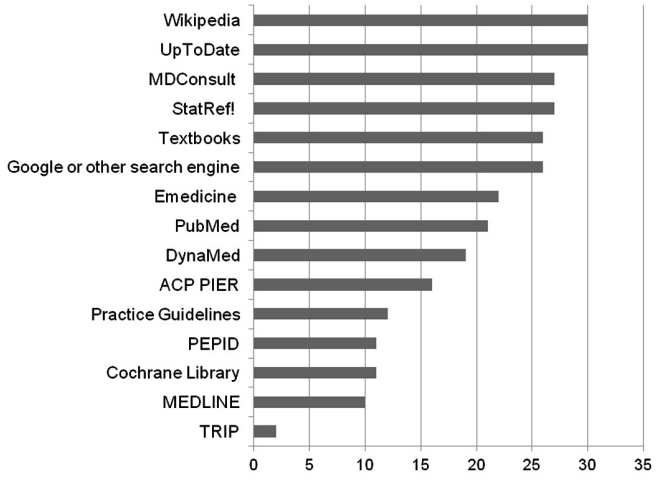
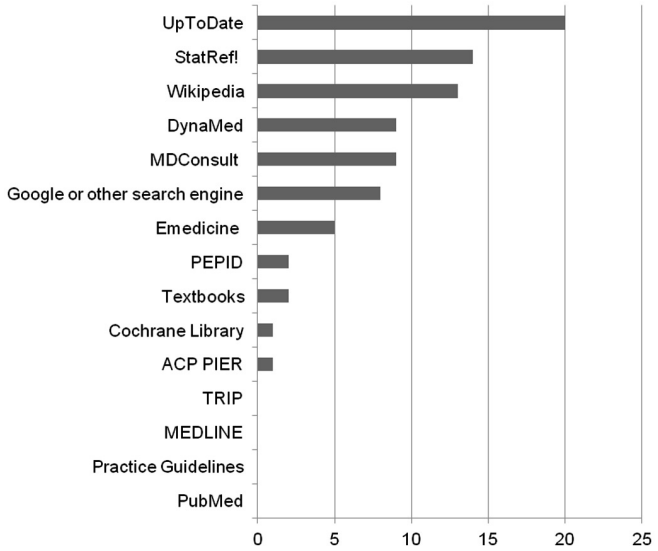


Fig. 2. Undergraduates' ranking of their top three favourite resources.



The survey of Year 3 clerkship students reveals a similar issue. When asked to rate how well the library instruction received in the first two years of their program prepared them for their clinical information needs, a majority of students (30 out of 34) rated it satisfactory or better, and no one responded that it didn't prepare them at all. Students also felt very confident that they could find the clinical information that they needed. However, they noted the following barriers to finding evidence: not knowing where to look or how to search, not having enough time to sift through irrelevant information, and lacking access to specific resources (mainly UpToDate, to which the library does not subscribe).

In order to determine which information sources should be taught as part of an effective instructional program, respondents were asked to list and rank their top ten most commonly used resources. The resulting list was dominated by UpToDate (accessed through personal subscriptions), Wikipedia, and other synthesized resources. Figure 1 presents the most commonly listed resources, while Fig. 2 presents the resources that were ranked most frequently in the top three. When students were asked in an open-ended question what their clinical preceptors recommended, UpToDate was listed five times more than any other source. Many of the faculty collaborators indicated that they wanted students to learn to use tools besides UpToDate.

Since this survey was conducted, the Faculty has begun revising the EBM component of its undergraduate curriculum, and the library has also been involved in this process. Many of the questions asked of other groups were not relevant to the undergraduate group, because IL instruction is integrated into their curriculum.

Graduate students, residents, and faculty

Survey results for residents, graduate students, and faculty included responses from at least half of the departments and divisions in the Faculty. IL instruction to graduate students, residents, and faculty is largely dependent on individual faculty members contacting librarians directly to arrange a "one-shot" session on library resources. In the case of graduate students and faculty, this happens very infrequently (fewer than five sessions per year). The Library also offers one-on-one consultations, which is a very popular service and one of our main methods of providing in-depth IL training to these groups. More than 500 one-on-one consultations are requested each year from all faculties.

Graduate survey:

Thirty-seven students responded to the graduate survey (response rate $\sim$17.29%). Overall, 31% recalled attending a library training session in the previous two years. They reported being able to find relevant and appropriate information most of the time (84%), with 50% stating that they frequently find what they need and 9% stating that they always find what they need. The most frequently reported barrier was lack of online access to journal articles (either older articles that are only available in print or particular titles to which the library does not subscribe).

When asked to rank the information resources that they use for their research, 96% ranked PubMed as an essential resource, followed by MEDLINE (56%), and Google or another search engine (54%).

Graduate students were most interested in receiving training on advanced database search skills (58%), an introduction to Refworks (58%), how to keep up to date with the literature (46%), how to do a systematic review search (46%), and reference tracking (46%).

Interactive Web-based tutorials (68%) and small group computer lab sessions (46%) were preferred methods for delivery of training.

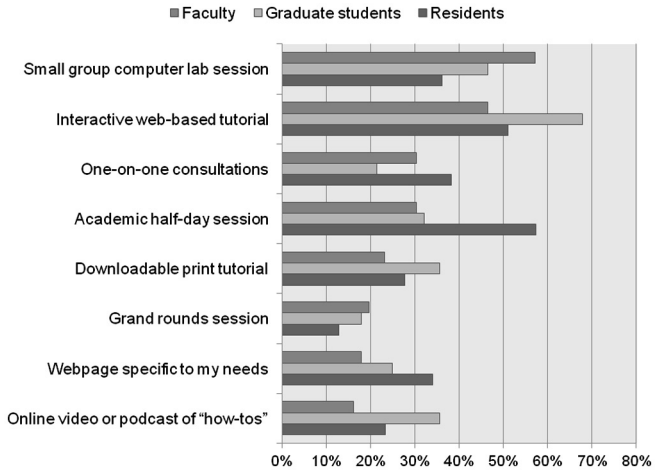
Resident survey

All residents receive a brief (less than 15 minutes) orientation on library resources during the residency orientation. Some residents (including all new Family Medicine and Pediatrics trainees) participate in one of

Table 1. Residents, graduate students, and faculty training and skills.

	Residents (%)	Graduate Students (%)	Faculty (%)
Attended instruction session in last 2 years	51.0	31.0	11.0
Able to find relevant and appropriate clinical information:			
Always	9.6	9.4	16.7
Frequently	53.8	50.0	50.0
More often than not	26.9	25.0	27.8
Sometimes	9.6	12.5	3.7
Never	0	3.1	1.9

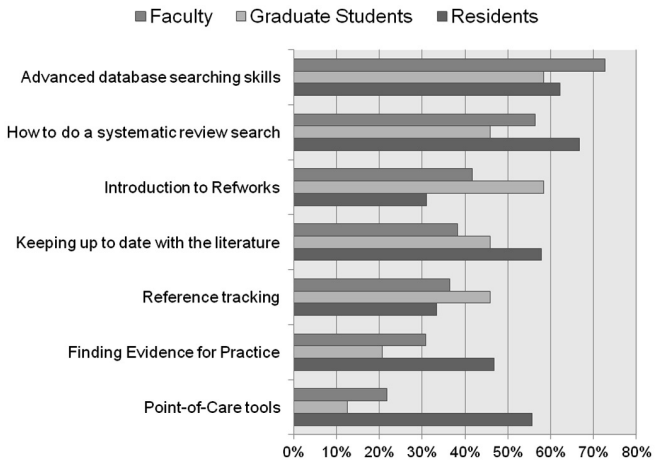
Fig. 3. Preferred delivery mode for training.



two evidence-based medicine workshops offered throughout the year, for which librarians provide an information retrieval session. Residents may participate in a voluntary week-long research trainees' workshop which includes one database searching session and one citation management session. Finally, some program directors contact liaison librarians directly to arrange a "one-shot" session for residents. (Table 1, Figures 3 and 4) 57 residents responded to the survey (response rate ~6.75%). 82% were located on site at the University Hospital. Residents in every year of training were represented, although more than half of respondents were in their first two years (Year 1 = 26%; Year 2 = 31%) 51% of respondents recalled attending a library training session in the previous two years. Most respondents (90%) reported being able to find relevant and appropriate clinical information most of the time, with 54% stating that they frequently find what they need and 10% stating that they always find what they need. In an open-ended question about barriers to finding information, common problems included: lack of access to specific resources (especially UpToDate), too many resources to look through, a lack of evidence on specialized topics, and insufficient search skills.

When asked to rank the clinical information resources that they use, 72% ranked UpToDate as an essential resource, followed by Google or another search engine

Fig. 4. Training topics of interest.



(67%), PubMed (61%), MEDLINE (47%), and textbooks (47%).

Residents were most interested in receiving training for how to do a systematic review search (66%), advanced database searching skills (62%), and how to keep up with the literature (58%).

Academic half-day sessions (57%) and interactive web-based tutorials (51%) were preferred methods for delivery of training.

Faculty survey

Sixty-five faculty members responded to the survey (response rate ~7.75%). Of the respondents, 55% replied that they were currently practicing in a clinical setting. Only 11% recalled attending a library training session in the previous 2 years. They reported being able to find relevant and appropriate information most of the time (90%), with 50% stating that they frequently find what they need and 17% stating that they always find what they need. Similar to the graduate students, the main barrier reported by this group was online access to journal articles, although some also mentioned lack of searching skills and finding relevant information as barriers.

When asked to rank the information resources that they use for research (i.e. primary research rather than synthesized clinical tools such as DynaMed or UpToDate), 83% ranked PubMed as an essential resource, followed by MEDLINE (57%) and Google or another search engine (41%).

Faculty members were most interested in receiving training on advanced database search skills (73%), how to do a systematic review search (56%), keeping up to date with the literature (38%), and reference tracking (36%).

The survey also asked faculty what they wanted students to learn. Top responses were: basic database search skills (82%), advanced database search skills (64%), how to do a systematic review search (60%) and an introduction to Refworks (50%).

Small group computer lab sessions (57%) or interactive Web-based tutorials (46%) were preferred methods for delivery of training.

Discussion

Returning to the original research questions, the results reveal the following:

1. Who are librarians currently reaching with instruction?

IL instruction is provided to undergraduate students at several points throughout their program, so they are being reached. However, the Library's current instruction program appears to only reach half of residents, less than a third of graduate students, and a small fraction of faculty.

2. Are librarians reaching everyone who could benefit from instruction?

Despite a lack of training in some groups, most respondents reported being able to find relevant and appropriate information when needed, and reported high confidence in their own ability to find information. However, recognizing that self-reported results are subject to bias, this does not necessarily mean that these users could not benefit from instruction. Many open-ended comments suggested frustration with accessing information and a potential need for training. When asked to describe obstacles and barriers to finding information, the following replies were given:

- "Clinical search engines difficult to find specific info" (undergraduate).
- "Too much irrelevant information" (undergraduate).
- "Some of the more technical journals are not always carried by our library" (graduate).
- "Not knowing how to use many databases" (graduate).
- "Using search engines appropriately and efficiently" (resident).
- "Many topics I have questions about don't seem to have good evidence available to guide practice" (resident).
- "Lack of access to many journals, and embargoes lately" (faculty member).
- "Time to do the literature searches and review the information produced" (faculty member).

Some graduate students and residents reported not being able to access resources to which the library does subscribe, meaning that either these resources need to be more visible on the library website, or the process of finding them needs to be emphasized.

Past research suggests that users who have not received training often rely on what they have previously learned or discovered on their own which can lead them to default to tried and true resources [8, 25]. In some cases, they are simply not aware of what is available [23]. The authors speculate that this is likely the case with library users in the Faculty, since many resources in the library collection appear to be underused. Although medical students do use a variety of synthesized resources, the residents rely largely on UpToDate (to which individuals personally subscribe), and all groups rely on PubMed/MEDLINE, because of familiarity and ease of use. Faculty and graduate students reported occasional use of a handful of research-oriented databases, but many other resources remain unused or unknown. As part of a well-rounded academic medical service, efforts should be made to promote the benefits of these less familiar resources and to make users aware of the breadth of materials available to them.

It may also be that many individuals, whether they receive training or not, do not perceive a need to move beyond their standard toolkit except in specialized circumstances, especially as they become more experienced. For example, clinicians, who model behaviours for resident and student trainees [38], use UpToDate heavily at least partially because it meets the need for quick, concise information, and it is supplied by some departments to practitioners in the hospitals. The library does not have access to UpToDate due to the cost of an institutional subscription. Information literacy instruction would be valuable in raising awareness about the value of other point-of-care tools of comparable quality, since some faculty members have raised concerns about student and resident reliance on UpToDate as their only source of information.

3. Are current programs effectively meeting user needs?

Overall, the instruction that is currently offered appears to be geared towards user needs and generally perceived as helpful. Respondents are generally able to find the information they need, although there is still much room for improvement.

It is clear that undergraduate medicine information literacy instructional program needs to be revised in order to make it less repetitive, by focusing more on laddered instruction of database searching. Historically instruction focused a great deal on promotion of synthesized clinical information tools, which is reflected in students' broad use of those resources. However, these tools are not difficult to use once one is familiar with them, and both faculty and student feedback indicated that skills in searching the primary literature via databases needed to be strengthened. Other articles have provided year-by-year curriculum outlines that describe laddering strategies for teaching MEDLINE searching, evidence-based medicine concepts, integration with information technology instruction and instruction in various formats. [12–15, 37]. All of these outlines will inform the improvement to the undergraduate medicine information literacy instructional program, although the authors will have to work within the curriculum model defined by the Faculty of Medicine and Dentistry.

Student use of Wikipedia is a continuing issue of concern to faculty, but Wikipedia was still the most commonly used resource by the medical students who responded to this survey. Several students commented on the appropriateness of using Wikipedia, suggesting that students are aware of its limitations. As suggested by previous research, future information literacy instruction should include substantial time for discussion of the appropriateness of non-medical websites as an evidence source, since the use of these resources is ubiquitous [24]. These discussions can also turn into a springboard to discuss effective use of library resources.

The main issue for residency training is consistency. The university has over 50 residency programs, and librarian involvement in the curriculum largely depends on residency program directors. As a result, some residents end up receiving very little training, while others receive

the same introductory IL instruction multiple times (this problem happens when residents have already attended one of several voluntary workshops on top of their regular training). Although a little repetition is not bad, there may be a need to develop laddered instruction for residents with varying skill levels and comfort with the library's electronic resources. More importantly, librarians need to communicate more with residency program directors about IL instruction options. To date, most instruction has been embedded in as "one-shots" in the curriculum or as part of an evidence-based workshop, but there are several models with which the authors can experiment [28–30].

In-person training for graduate students and faculty members is very infrequent, so extensive follow-up is needed to ensure that they are receiving adequate training support. As discussed in the literature review, these groups are typically harder to reach with conventional instruction [31–33]. Graduate students in this survey were interested in workshop topics (e.g. searching the primary literature and citation management) similar to those in previous studies [31, 32], so it is hoped that Web-based tutorials and an increased number of drop-in sessions on these topics will prove attractive. For faculty members, librarians will rely on aggressive promotion of on-demand library services to ensure point-of-need questions are answered. The faculty survey did indicate some interest in attending drop-in sessions as well, which differed from a previous study of public health faculty in which they preferred to contact a librarian by email or phone for immediate assistance [33]. Ideally, faculty training will be done through continuing education sessions and faculty development workshops, so they have additional incentive to attend.

4. How can librarians make sure that everyone who needs instruction receives it in a timely and appropriate way?

There are clearly many users who are not receiving IL instruction. Much work remains to be done to ensure that user needs are being met, be it through in-person instruction or other methods.

One of the major goals of this evaluation was to determine level of demand among graduate students, residents and faculty for alternate modes of training delivery, such as Web-based instruction using asynchronous methods. The Faculty's recent move towards a completely paperless environment, defines the structure of future instruction for undergraduate students as a combination of in-class instruction and interactive or video tutorials integrated into the virtual learning environment.

For graduate students, residents and faculty, interactive Web-based tutorials, delivered through the library website, were preferred over other virtual delivery methods such as online videos, podcasts, or downloadable print tutorials. Most notably, graduate students were the only group to express a higher preference for Web-based tutorials over some form of in-person instruction. Online tutorials are needed not only for undergraduate medicine (as required by the Faculty curriculum), but also for the substantial number of users who prefer to learn on their own, require assistance at point of need, or are located at a distance. As discussed, online delivery appears to be an effective option for information literacy instruction [19–21, 34, 35].

However, most respondents still preferred in-person instruction sessions. Faculty preferred small group computer labs, while residents preferred it be included in their academic half-day sessions (part of the in-person curriculum). In recent years, instruction sessions have been provided primarily at the request of faculty members, instructors, and program directors, but the authors will explore providing drop-in workshops not associated with any formal curriculum, to see if there is interest.

In response to these results, the authors have begun revising undergraduate information literacy instruction in collaboration with faculty. Preclinical undergraduate training is focused on using clinical databases such as DynaMed and ebook collections such as Access Medicine, and students are advised on appropriate uses of Wikipedia. Clinical undergraduates now spend more time on searching bibliographic databases, in response to the importance of developing search skills that was identified in the surveys.

For graduate students, residents, and faculty members, the authors are planning to develop more tutorials, especially to address the needs of off-campus users. The survey indicates a preference for interactive tutorials, and when possible, the authors will try to provide that option. However, developing interactive tutorials can be extremely time-consuming to create and maintain. The library's current Web-based library tutorials receive a modest number of hits, raising the question of why the existing ones are not being used more. Research on best practices in tutorial design to ensure optimum use is required.

The authors are also using these study results to inform development of drop-in workshops, since they highlighted which topics would most likely attract attendees. These results will also be used to demonstrate the need for student and resident instruction to faculty instructors and program directors.

Some basic assessment on changes at the undergraduate level has already occurred, and feedback has been positive. However, the authors intend to conduct follow-up surveys once more changes have been implemented.

Limitations

There are several limitations to this study. First of all, survey data is based on individuals' self-reporting of perceived needs and abilities, which is subject to bias. Also, participation in the online survey was voluntary, the respondents are not representative of the entire population, and the survey had a low response rate. Finally, respondents were from one university, meaning that results are not able to be generalized.

Despite these limitations, this study has value as one of the few attempts to survey to IL training at a faculty-wide level, rather than targeting specific programs or classes. It provides a larger picture of what all user groups in a large medical and dental faculty potentially require for information literacy training as they progress through their educational and research career.

Conclusion

The J.W. Scott Library is providing adequate IL training to particular groups in the Faculty of Medicine and Dentistry such as undergraduate students and several resident programs. This training will be revised and improved in response to these results. However, librarians are not actively providing instruction to many other groups, most notably graduate students and faculty. Much work remains to be done to improve delivery options and promote training opportunities to these harder-to-reach groups. This data provides a baseline overview of existing instruction across groups, determines potential need for IL instruction and what should be taught, and identifies best methods for delivery. Overall, it will focus librarian efforts in order to develop a comprehensive training program centered on Faculty needs.

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Appendix A: Clinical Undergraduate Survey

1) What year of your program are you in?
   Third_____ Fourth_____
2) How often are you able to find relevant and appropriate evidence on clinical topics?
   1. Never 2. Sometimes 3. More often than not 4. Frequently 5. Always
3) Please describe any obstacles or barriers you have found in finding evidence on clinical topics.
4) When I need to find evidence on a clinical topic, I use the following resources. Please number in order of preference the 10 resources that you use most (1 being most used and 10 being least used):
   ____ Pubmed
   ____ Medline
   ____ Dynamed
   ____ UpToDate
   ____ Wikipedia
   ____ Statref
   ____ ACP Pier
   ____ PEPID
   ____ MD Consult
   ____ TRIP
   ____ Cochrane Library
   ____ Textbooks
   ____ Practice Guidelines
   ____ Emedicine
   ____ Google or other search engine
   ____ Other (please describe):
   ____ Other (please describe):
5) Which materials have your preceptors suggested that you use to answer clinical questions? Please specify.
6) Rate how well the library instruction that you received in the first two years of your program prepared you for your clinical information needs today.
   1. Not at all 2. Sort of 3. Satisfactory 4. Well 5. Extremely well
7) Do you have any other comments on the library services in your first two years?
8) If the library were to offer lunchtime instructional programs, are there any subjects you would like to see covered? Please specify.

Appendix B: Faculty Survey

1. With which department are you affiliated? (Please list all relevant departments).
2. Are you currently practicing in a clinical setting? Yes No (if NO, skip to Question 7)

Clinical Information Needs:

3. How often are you able to find relevant and appropriate evidence on clinical topics related to your practice?
   1. Never 2. Sometimes 3. More often than not 4. Frequently 5. Always
4. Please describe any obstacles or barriers you have found in finding information on clinical topics.
5. Please rank the following resources with respect to searching for clinical information.
   Options:
   1. Essential Resource to Me
   2. I sometimes use this resource
   3. This is not a useful resource
   4. I don't know or don't use this resource
   ____ ACP Pier
   ____ Cochrane Library
   ____ Dynamed
   ____ Emedicine
   ____ Google or other search engine
   ____ MD Consult
   ____ Medline
   ____ PEPID
   ____ Practice Guidelines
   ____ Pubmed
   ____ Statref
   ____ Textbooks
   ____ TRIP
   ____ UpToDate
   ____ Wikipedia
   ____ Other (please describe):
   ____ Other (please describe):
6. For the resources you described as "essential," please explain briefly why you find them valuable.

Research Information Needs:

7. Do you currently have staff who assist you with finding information related to your research? (e.g. research coordinator or librarian)
   ___Yes ___No
8. Please describe any obstacles or barriers you have found in finding information related to your research interests.
9. Please rank the following resources with respect to searching for research interests.
   Options:
   1. Essential Resource to Me
   2. I sometimes use this resource
   3. This is not a useful resource
   4. I don't know or don't use this resource

   ____ EMBASE
   ____ CINAHL
   ____ Cochrane Library
   ____ Google or other search engine
   ____ Medline
   ____ Opensigle
   ____ Psycinfo
   ____ Proquest Dissertations and Theses
   ____ Pubmed
   ____ Scopus
   ____ Table of Contents of journals directly related to my research topic
   ____ Web of Science
   ____ Other (please describe) _____
   ____ Other (please describe) _____
10. For the resources you described as "essential," please explain briefly why you find them valuable.

Training on Information Resources:

11. Did you or your employees attend any kind of training session on library and information resources in the past two years?
    ____ No
    ____ Yes, please describe _____

12. If the Scott Library were to offer training sessions, which subjects would be most useful to you? Please check all that apply.

    ◦ Introductory research skills (eg: how to decide which database to use, how to do a basic search)
    ◦ Advanced database searching skills (eg:Advanced Medline search, Advanced Scopus search, Advanced EMBASE search)
    ◦ Point-of-Care tools (eg: Dynamed, First Consult, Clinical Evidence, Pepid)
    ◦ Finding Evidence for Practice
    ◦ How to do a systematic review search
    ◦ Reference tracking (finding out how often particular articles have been cited)
    ◦ Introduction to Refworks reference manager software
    ◦ Using mobile devices to access clinical or research information
    ◦ Accessing resources from off-campus (eg: home)
    ◦ Searching for grey literature
    ◦ Advanced search tips for search engines like Google
    ◦ How to do a patent search
    ◦ Keeping up to date with the literature (e.g. receiving alerts)
    ◦ Other, please specify _____

13. If the library were to offer training or research help, what would be the most useful form of delivery? Please check all that apply.

    ◦ academic half-day session
    ◦ grand rounds session
    ◦ one-on-one consultations
    ◦ small group computer lab session
    ◦ webpage specific to my needs
    ◦ interactive web-based tutorial
    ◦ downloadable print tutorial
    ◦ online video or podcast of "how-to" on specific topics
      (please list topics) _____
    ◦ Other (please describe):_____

14. If you were looking for assistance in using library information resources, where would the most convenient place for you to access online help or tutorials? Please check all that apply.

    ◦ Faculty website
    ◦ Library website

- Virtual Learning Environment (e.g. e-Class or Homer)
- Database help page (e.g. Pubmed Help page)
- Facebook
- Youtube
- iTunes podcast directory
- Anywhere that is easily accessible by mobile devices
- Other (please describe):_____

15. Are you aware that the Scott Health Sciences Library offers a one-on-one consultation service for faculty and students?

Yes No

16. If you answered Yes to the question above, have you used this service?

Yes No

Student and Resident Needs:

17. If the Scott Library were to offer training sessions to the students and residents with whom you work, which subjects do you think would be most useful to them? Please check all that apply.

- Introductory research skills (eg: how to decide which database to use, how to do a basic search)
- Advanced database searching skills (eg:Advanced Medline search, Advanced Scopus search, Advanced EMBASE search)
- Point-of-Care tools (eg: Dynamed, First Consult, Clinical Evidence, Pepid)
- Finding Evidence for Practice
- How to do a systematic review search
- Reference tracking (finding out how often particular articles have been cited)
- Introduction to Refworks reference manager software
- Using mobile devices to access clinical or research information
- Accessing resources from off-campus (eg: home)
- Searching for grey literature
- Advanced search tips for search engines like Google
- How to do a patent search
- Keeping up to date with the literature (e.g. receiving alerts)
- Other, please specify _____

18. If the library were to offer training or research help to students and residents, what do you think would be the most useful form of delivery for them? Please check all that apply:

- academic half-day session
- grand rounds session
- one-on-one consultations
- small group computer lab session
- webpage specific to my needs
- interactive web-based tutorial
- downloadable print tutorial
- online video or podcast of "how-to" on specific topics
- (please list topics) _____
- Other (please describe):_____

Conclusion:

19. Do you have any other comments about instructional services offered by the library?